Social development – a multidimensional approach to social development analysis. Country level evidence for year 2011.

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SOCIAL DEVELOPMENT – A MULTIDIMENSIONAL APPROACH TO SOCIAL DEVELOPMENT ANALYSIS.

Country level evidence for year 2011.

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Abstract

The study investigates disparities in social development in 144 countries worldwide. In the paper we aim to investigate cross-country differences in social development level in year 2011, as well as to estimate inequalities on the field. Secondly, we assess relative social development level differences – gaps (divides) among countries. For the analysis purposes, we apply: descriptive statistics analysis, Kernel epanechnikov density (to check for world distribution of social welfare), inequality measure – Gini coefficient and square Euclidean distance (full linkages) method.

The analysis sample encompasses 144 countries, and we mainly collect statistical data for the year 2011 (if available). The data applied in the study are derived from databases like: United Nations Millennium Development Goals Database; United Nations Department of Economic and Social Affairs, Population Division; United Nations Educational, Scientific and Cultural Organization; World Health Organization; International Human Development Indicators.

JEL codes: I0, I2, I3, O15, O50

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1. Social development – theoretical outline.

The problem of social development remains of critical importance. There exists huge set of literature and empirical studies identifying problems of definition, measurement methods on the field of social development. The discussion on the problem, its determinants, and/or measurement proposals can be

found in the work of i.e Streeten and ul Haq (1981), Lucas (1988), Sen (1985, 1992), Behrman (1990), Birdsall and Nancy (1993), Bozer, Ranis and Stewart (2000, 2004). Also the issues on social development are in the centre of interests of international agencies like i.e. United Nations Development Programme, UNESCO, WHO and many others.

Social development is broadly associated with the large thing called general societal welfare (wellbeing). It is broad and multidimensional in nature. The multitude of ways to define it is mainly a consequence of wide array of factors that constitute the issue. The concept of social development encompasses a variety of aspects of human life, which are often non-material ones, and can refer to different dimensions of education, healthcare, social and political freedom, or race. It is widely thought that social development goes far beyond pure economic development, however it can enhance entering dynamic and sustainable economic development (and growth) pattern. The phenomenon of social development is also associated with human capabilities (see Sen 1985, 1992), possibilities to educate, self-develop and lead healthy life. Social development encompasses all kinds of "functionings" (see again Sen 1992), which enable any individual to get personal achievements and that reflect his life-style. Social development also refers to all kinds of freedom, freedom perceived as opportunities to take active part in social, economic, political and cultural life. Any kind of exclusion is always treated as the denial of social welfare. The freedom to develop reflects directly living-conditions of any individual, and in that sense it is a prerequisite for dynamic economic growth and development. Rahman and Wandschneider (2003) stress the importance of factors like social relationship, security of workplace or environmental quality.

Despite those, there is no widely accepted consensus on crucial factors determining the level of social development as well as we still seek for the best measure it. In recent years there have been elaborated many composite measures (indexes) which try to capture the multidimensionality of social development, i.e. Human Development Index (developed by United Nations), Physical Quality of Life (developed by Morris), or many others.

In the paper, we strongly support the idea of purely non-income (non-monetary) approach to social development. However, the notion of social development is broad and can cover a wide array of aspects of social, cultural or political life, we prose a reductionist approach and we aim to concentrate exclusively on arbitrary selected variables. The social development variables are presumed to be quality-of-life attributes, and are to measure the well-being directly.

2. Cross-country disparities in social development level.

For the analysis purposes, we have completed the dataset composed of 144 world economies, and statistics are derived for year 2011. The statistical data sources are following: United Nations Millennium Development Goals Database; United Nations Department of Economic and Social Affairs, Population Division 2011; UNESCO; World Health Organization; International Human Development Indicators datasets. Using the cited databases, we have chosen 8 different variables (indicators), which are broadly treated as proxies of social development level. These are: Life Expectancy[1] (LE[2]), Drinking Water Access (DWA), Improved Sanitation Coverage (ISC), Total Fertility Rate (TFR), Maternal Mortality Rate (MMR), Infant Mortality Rate (IMR), Combined Gross Enrolment (CGE) and Mean Years of Schooling (MYS). We have classified the indicators into two groups:

a) Indicators positively influencing human development (***P-HD***, Positive-Human Development) – these are: LE, DWA, ISC, CGE and MYS.
b) Indicators negatively influencing human development (***N-HD***, Negative-Human Development) – these are: TFR, MMR and IMR.

The empirical part of the paper encompasses of three sections. In the first step we aim to check for descriptive statistics and estimate the Gini coefficients for given variables in the sample. Secondly, we estimate densities lines for each variable separately to learn about the world distribution of social welfare approximated by the *P-HD*, and world distribution of exclusion from such – approximated by *N-HD*. To complete the analysis of the world differences in social development, we calculate square Euclidean distances[3] (metrics) to know about the relative backwardness of economies analyzed in relation to reference country (best performing country in the sample).

2.1. World distribution of social welfare.

As stated in previous section, we have selected statistical data for 8 different variables – assumed to be proxies of social development level, for 144 economies. In the following Table 1 (see below), we report on descriptive characteristics of chosen variables in year 2011. In addition, the Gini coefficients values

[1] Detailed explanation of selected variables is put in Appendix 2.
[2] In the following parts of the paper, we use systematically the abbreviations.
[3] Full linkages

are calculated. The variables are expressed in different units, which imply some difficulties with direct comparisons among countries. LE, TFR and MYR are expressed in absolute numbers, while the rest of them are expressed as relative ones.

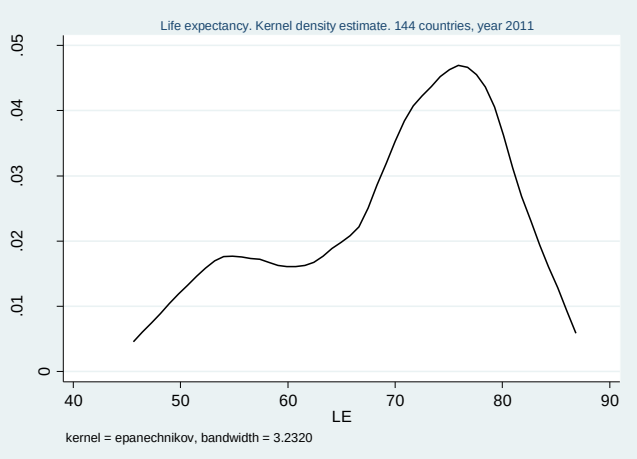
Table 1. Basic descriptive statistics for social indicators. Year 2011. 144 countries.

Variable	Obs	Mean	Std. Dev.	Min	Max	Gini coefficient
LE (years)	144	69,68	9,72	48,82	83,61	0,077
DWA (%)	144	86,11	16,42	38	100	0,09
ISC (%)	144	71,26	30,18	9	100	0,23
TFR (no of children)	144	2,77	1,38	1,13	6,92	0,266
MMR (per 100 000 live births)	144	203,67	265,16	2	1200	0,64
IMR (per 1000 live births before age of 1 year)	144	31,94	29,73	2,05	123,94	0,499
CGE (% of total no of 3 school groups)	144	72,02	17,57	29,6	112,1	0,138
MYS (for people at 25 years and older)	144	7,46	3,08	1,2	12,6	0,236

Source: own calculations using STATA 12.00. Data drawn from United Nations Millennium Development Goals Database, United Nations Department of Economic and Social Affairs, Population Division, UNESCO, World Health Organization, International Human Development Indicators databases. Accessed: Sept 2012.

The variability of social indicators values is presented in Table 1. Analyzed jointly with smooth densities charts give a general idea about worldwide differences in social welfare distribution (see charts 1,2,3,4,5,6,7 and 8).

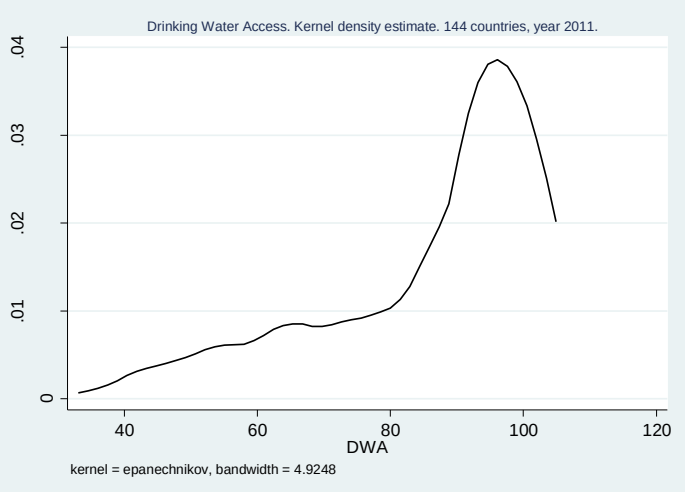
Chart 1. Life Expectancy world distribution line (Kernel density). Year 2011, 144 countries.



Source: own estimates using STATA 12.0. Data applied drawn from United Nations Department of Economic and Social Affairs, Population Division datasets. Accessed: Sept 2012.

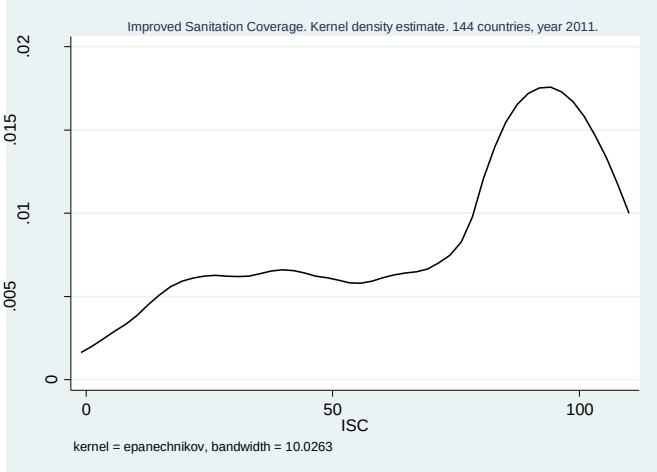
In case of life expectancy, we observe relatively low differentiation among countries. The Gini coefficient is 0,077, which results to be low, and indicates no huge differences life expectancy (expressed in years) – the variable value is fairly distributed among countries. Chart 1 (see above) reports on density in the variable distribution. We see the twin-peak line, which suggests existing two different groups of countries. In such case, the polarization is evident. One group (in right part of the plot), constitutes economies that enjoy relatively high life expectancy – these are highly developed countries. The group consists of 84 economies, where LE varies from about 70 (i.e. Belarus, Trinidad and Tobago, Azerbaijan and Belarus) to 83 years in Japan. Note, that from the densities values we can conclude that probability of achieving the LE value at 70-80 years is relatively high and varies from 0,3 – 0,5. While the left one peak suggest existence of different group of countries where the LE varies from 48 years (in Guinea-Bissau and Lesotho), to about 70 years (i.e. in Iraq, Indonesia, Guyana) – there are 60 countries in the group. However, despite the clear emergence of the two peaks, we can conclude than in general the achievement is terms of LE are high in the world sample.

Chart 2. Drinking Water Access world distribution line (Kernel density). Year 2011, 144 countries.



Source: own estimates using STATA 12.0. Data applied drawn from United Nations Millennium Development Goals Database. Accessed: Sept 2012.

Chart 3. Improved Sanitation Coverage world distribution line (Kernel density). Year 2011, 144 countries.

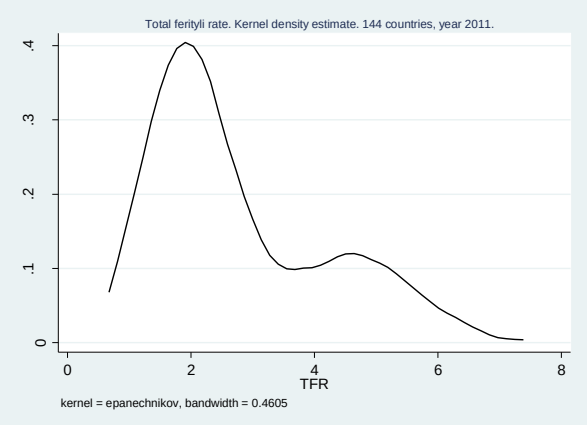


Source: own estimates using STATA 12.0. Data applied drawn from United Nations Millennium Development Goals Database. Accessed: Sept 2012.

Secondly, we aim to analyze the statistics on drinking water access and improved sanitation coverage. We suggest analyzing them jointly as the two variables reflect level of development of basic sanitation infrastructure. From descriptive statistics (Table 1) we conclude that average levels of DWA are slightly better than in case of ISC. Also the Gini value for DWA – (0,09) suggest almost even distribution in the country sample. The mean access for improved sanitation results to be a bit lower (71,26% of population), and at the same higher Gini is reported – (0,23). However, the data seem to be optimistic, they shall be interpreted carefully. If we see chart 2 and 3, where densities line are drawn for each variable, the picture of performance of countries in terms of DWA and ISC differs slightly. In two cases we observe emergence of one-peak line accompanied by long left tail. Such construction of density line suggests existing one relatively homogenous group of countries, where drinking water access (counted as % of total population having access) and improved sanitation coverage (counted as % of population having access) is at high level – about 90-100% of total population enjoying access to both kinds of facilities. However, in case of DWA the probability of having access to drinking water by almost 100% of population is close to 0,2-0,4 (90 countries in the sample), if we go to chart 3, we see that the analogues value is at about 0,15-0,2 of probability (60 countries). The left tail in chart 2, stands for the rest 58 countries where DWA varies from 89% in Syrian Republic to 35% in Ethiopia. The probability of having the score for DWA between 38% - 89% is from close to 0,0 to almost 0,1. It suggests high diversification of level of DWA in the 58 countries included in the left tail of the distribution. In chart 3,

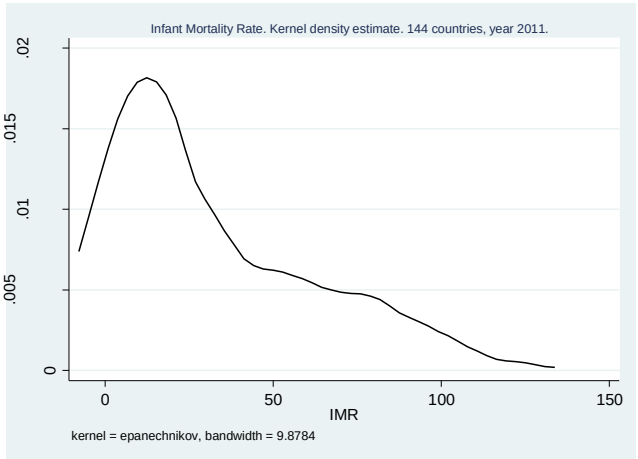
for ISC, the situation is similar. There are 64 economic included in the left tail, where improved sanitation coverage varies from 9% in Niger to 89% in Macedonia. Similarly, it suggests high diversification of the group of 64 countries.

Chart 4. Total Fertility Rate world distribution line (Kernel density). Year 2011, 144 countries.



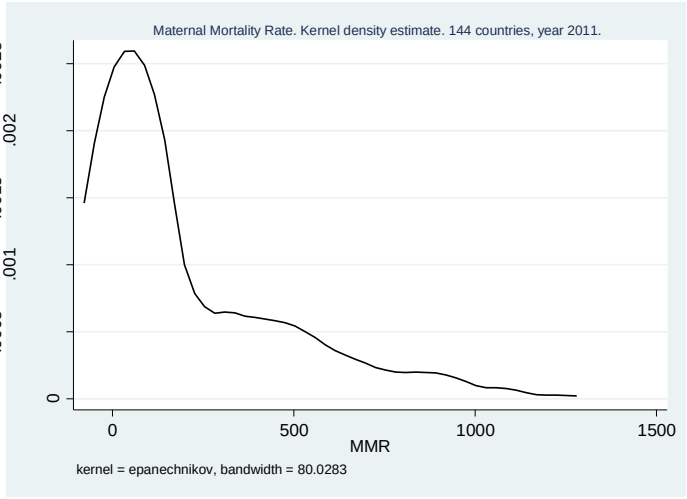
Source: own estimates using STATA 12.0. Data applied drawn from United Nations Department of Economic and Social Affairs, Population Division datasets. Accessed: Sept 2012.

Chart 5. Infant Mortality Rate world distribution line (Kernel density). Year 2011, 144 countries.



Source: own estimates using STATA 12.0. Data applied drawn from United Nations Department of Economic and Social Affairs, Population Division datasets. Accessed: Sept 2012.

Chart 6. Maternal Mortality Rates world distribution line (Kernel density). Year 2011, 144 countries.

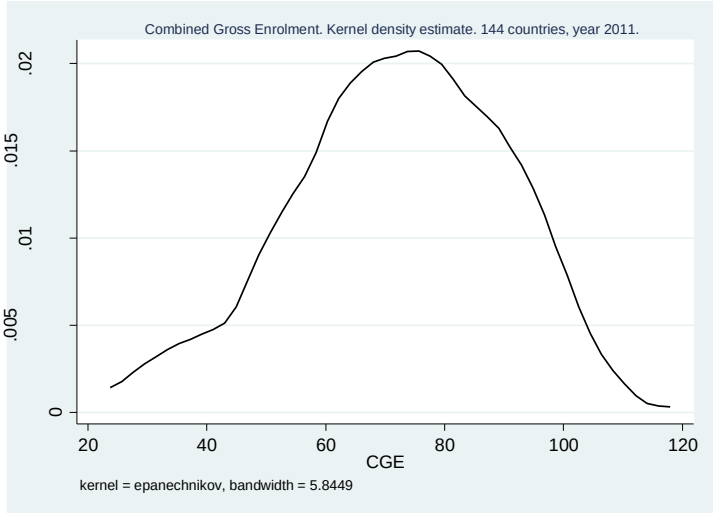


Source: own estimates using STATA 12.0. Data applied drawn from United Nations Department of Economic and Social Affairs, Population Division datasets. Accessed: Sept 2012.

In the next step we investigate the following 3 social factors – total fertility rate (TFR), infant mortality rate (IMR) and maternal mortality rate (MMR). The variables reflect basic access to medical care and healthcare system. High values of each variable suggest high deprivation of general access to medical care, and a time usually go along with very low overall socio-economic performance of countries. As we see from the descriptive statistics in Table 1, the average total fertility rate is 2,77 children per woman, the Min value reported is 1,13 children per woman (the value of 1,13 refers to Bosnia, but note that in many sequent countries like Malta, Austria, Portugal the value is not much higher), while the Max value is 6,92 children per woman (in Niger). We also need to stress that Niger is not the outside on the field. When analyzing raw data (see Appendix 1), we see that in the next 34 economies, the variable is above 4. Considering the fact, that such high fertility rates are common for low-income countries, this can constitute a great obstacle for entering economic development path, especially if GDP per capita annual growth rates result to be lower than crude birth rate. If we look at the following two variables statistics – MMR and IMR, the picture is even more alarming. In the analyzed set of countries the average maternal mortality rate is 203,67 woman per 100 000 live births. At the same time the best performing country on the field is Greece (MMR=2), while the worst country in the group is Chad and Guinea-Bissau, with the values MMR=1200 and MMR=1000 respectively. In addition, we need to note that in the next 49 economies the maternal mortality rate is still above the mean. The Gini coefficient reported in the case of MMR is 0,64 (the highest score of all variables), which suggests relatively highest inequalities

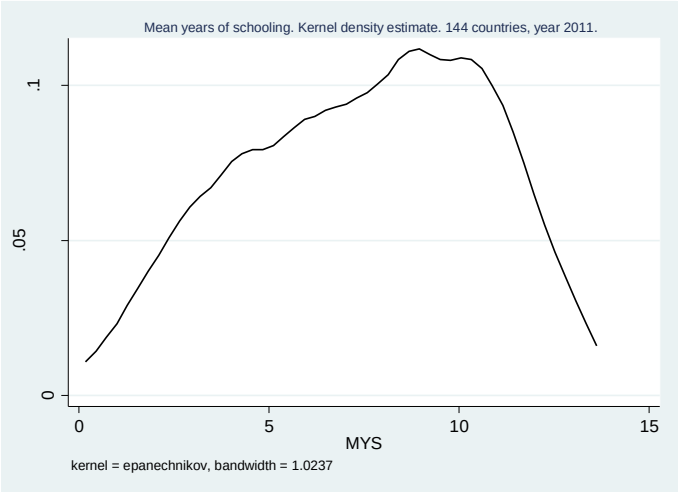
(disparities) in the variables in the 144 economies. In case of infant mortality rate variable, the statistics are evenly alarming. On average almost 32 (per 1000 live births) children die before age of 1. In the worst performing countries the IMR are 443 and 371, which again refers to Chad and Guinea-Bissau respectively. We also need to stress that in case of 71 economies (out of the 144 included in the sample), the IMR values is higher than the mean. This again shows quite a disadvantageous situation in the countries and assigns for low level of social development. In addition, we analyze the densities plots in charts 4,5 and 6. The density line in chart 4 gives us clear idea about the variable (TFR) distribution worldwide. Actually, we observe again an emergence of twin-peak line, which indicates formation of two distinct groups of countries that differ significantly. The left peak identifies the group of better off economies, where the probability of achieving the TFR=2 is about 0,3 – 0,4. The probabilities of a country to obtain a score of TFR below 2, is clearly lower – at about 0,1 – 0,2. The right peak, reversely show the group of countries which are evidently worse off in terms of TFR. Going to maternal mortality rate and infant mortality rate, we see that densities functions are similar in shape. In both cases, we observe an emergence of one-peak line (on the left side of coordinate system). This proofs existence of relatively homogenous groups of countries, where values of both variables are low. However if we see the densities values (probability), we see that these are rather low. In case of maternal mortality rate, the probability of achieving the MMR value a bit above "0" is at about 0,025 (2,5%). The probability of higher MMR are consequently lower, but the long right tail indicates high diversification of countries on the field. Similar situation is reported in chart 5, which refers to infant mortality rate. Again there emergence one-peak line (left located peak), which indicates rather a homogenous group of relatively wealthier countries, where the variable values are low. However, the long right tail shows that in middle and low-income economies the diversification in terms of IMR is high. Actually similar conclusions were drawn according to Gini coefficient for MMR and IMR.

Chart 7. Combined Gross Enrolment world distribution line (Kernel density). Year 2011, 144 countries.



Source: own estimates using STATA 12.0. Data applied drawn from UNESCO datasets. Accessed: Sept 2012.

Chart 8. Mean Years of Schooling world distribution line (Kernel density). Year 2011, 144 countries.

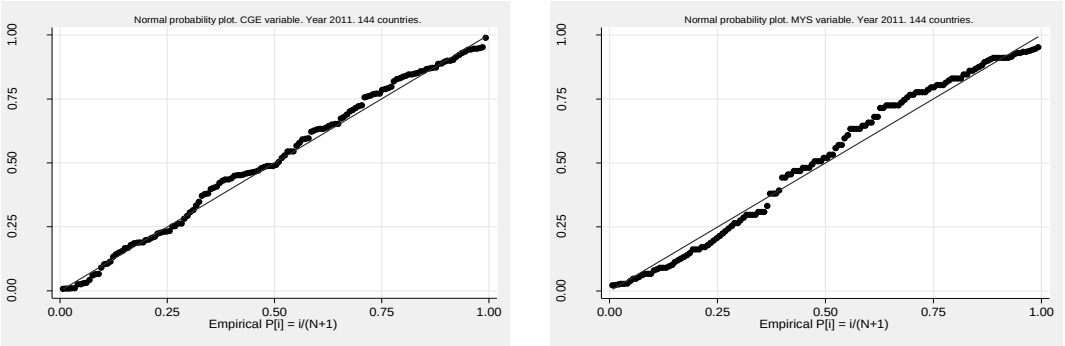


Source: own estimates using STATA 12.0. Data applied drawn from UNESCO datasets. Accessed: Sept 2012.

Finally, we investigate the variables of combined gross enrolment (CGE) and mean years of schooling (MYS). The preliminary data analysis shows that average country diversification on the field of schooling achievement is relatively low. The Gini coefficients are 0,138 – for CGE, and 0,236 for MYS, and indicate low inequalities. However, as can be read from data in Table 1, the differences between Minimum and Maximum values for both variables seem to be significant. In Djibouti, Eritrea, Kuwait, Niger and Nigeria the average CGE is slightly above 30% CGE, while in 51 countries the CGE is above 80%. In the group of 51 cited economies, there also countries like i.e. Bolivia, Peru, Colombia

or Venezuela, which are mainly classified as medium developed countries. If to look at MYS statistics, the average is almost 7,5 years. Again, there are 69 countries where are level of MYS is below the average. This suggests very poor developed educational system and basic education infrastructure like school access etc. Looking at charts 7 and 8, we conclude on world distribution of the variables values. In both cases the distributions are close to normal distribution (see chart 9 below).

Chart 9. Normal probability plots. CGE and MYS variables. Year 2011, 144 countries.



Source: own elaboration using STATA 11.2.

This suggests no significant disparities in the variables values across countries, which of course does not mean that in all countries the achievements are equal. The differences still exist.

2.2. On relative social development backwardness.

In the following part of section 2, we aim to learn about relative backwardness of countries in terms of social development. We run a study, applying square Euclidean distance approach, which allows estimating distances between pair of countries on the assumed field of interest. The methodology let us to know about relative distance (metric) between two points in *n*-dimension space and the value of distance shows how far the objects are located from each other. This is the pair-wise analysis, and it shows inter-country relations. In our case, we divide the distances estimates into two sets. As it was pointed in begging of section 2, we have classified chosen variables into two groups. We have created *P*-HD (*Positive*-Human Development) indicators group – these are: LE, DWA, ISC, CGE and MYS; and *N*-HD (*Negative*-Human Development) indicators group – these are: TFR, MMR and IMR. Consequently, the analysis is two-pattern. Simultaneously we estimate metrics for countries applying *P*-HD variables and – separately – applying *N*-HD variables. In each case, we have chosen the reference object – the best performing country in the sample if taking into account chosen variables. For *P*-HD

indicators this is Australia (Australia achieved highest average variables` values of LE, DWA, ISC, CGE and MYS), while for *N*-HD indicators – Greece (Greece achieved lowest average variables` values of TFR, MMR and IMR). In the following table 2, we present estimates results. The numbers indicate the metric value (distance value) for each country in relation to Australia (for *P*-HD) and to Greece (for *N*-HD). The higher the metric`s value the greatest distance is reported between the given country and reference one. As can be concluded from general estimates, the countries closest to Australia are Ireland, Republic of Korea, Denmark, Netherlands, Spain, Norway, Finland, and Greece. It can be interpreted as the lowest average differences between Australia and listed countries in terms of the 5 social variables. At the bottom on the table 2, reversely, we find countries, which are relatively most backward in relation to Australia. If we consider the *N*-HD indicator, we find 27 countries where the metric is close "0", which suggest that in terms of TFR, MMR and IMR these economies are equally well performing as Greece does. Also, we need to note that in case of the next 50 countries, the values is still below zero, which proofs very small differences in development level on the field. If so, the 77 countries (almost half of the sample) in relation to Greece report hardly any difference in achievements in *N*-HP indicators.

Table 2. Relative distance (metric) from reference country. Year 2011, 143 countries.

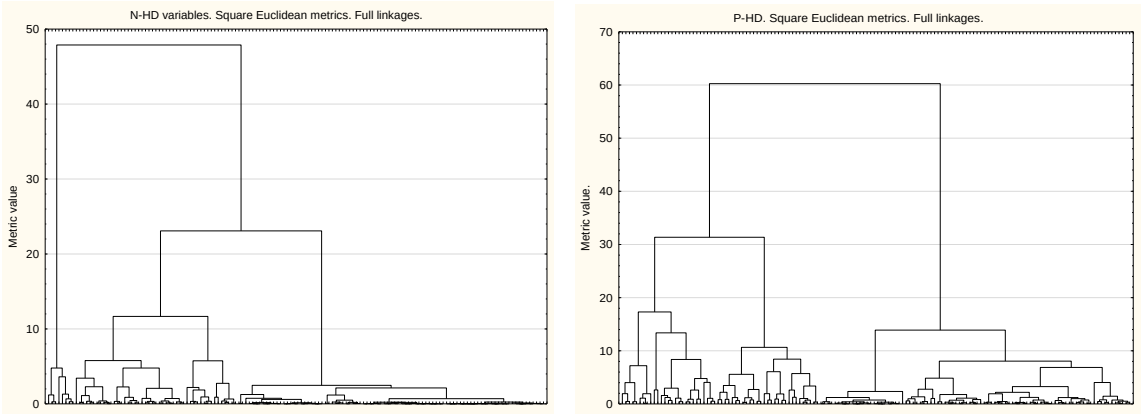
Cumulative metrics for indicators positively influencing human development (LE, DWA, ISC, GCE, MYS)				cumulative metrics for indicators negatively influencing human development (TFR, MMR, IMR)			
Reference country – **Australia**				Reference country - **Greece**			
Ireland	0,4	Iran	9,4	Spain	0,0	Nicaragua	0,9
Republic of Korea	0,5	Suriname	10,2	Switzerland	0,0	Ecuador	0,9
Denmark	0,6	Paraguay	10,3	Italy	0,0	Kazakhstan	0,9
Netherlands	0,6	Maldives	10,5	Czech Republic	0,0	Syrian Arab Republic	0,9
Spain	0,7	Trinidad and Tobago	10,7	Croatia	0,0	Belize	1,0
Norway	0,8	Honduras	10,9	Cyprus	0,0	Israel	1,0
Finland	0,8	Tajikistan	11,5	Germany	0,0	Morocco	1,1
Greece	0,9	Viet Nam	11,5	Slovenia	0,0	Jordan	1,3
Luxembourg	1,1	Oman	11,6	Hungary	0,0	Indonesia	1,4
Slovenia	1,1	China	11,7	Belarus	0,0	Azerbaijan	1,5
Iceland	1,1	Syrian Arab Republic	11,8	Poland	0,0	Philippines	1,6
Belgium	1,1	Qatar	12,2	Latvia	0,0	Kyrgyzstan	1,7
Canada	1,1	Azerbaijan	13,1	Japan	0,0	Paraguay	1,7
France	1,2	Bolivia	13,1	Canada	0,0	Honduras	1,7
United States of America	1,3	Indonesia	13,5	Estonia	0,0	Bhutan	2,2
Sweden	1,3	Guatemala	13,9	Republic of Korea	0,0	Uzbekistan	2,2
Israel	1,5	Gabon	16,2	Slovakia	0,0	Botswana	2,2
Austria	1,6	South Africa	16,7	Luxembourg	0,0	Namibia	2,4
Italy	1,7	Namibia	17,0	Austria	0,0	Guyana	2,5
Japan	1,9	Botswana	17,7	United Arab Emirates	0,0	Myanmar	2,8

Germany	2,2	Morocco	18,0	Bulgaria	0,0	Bangladesh	3,5
Switzerland	2,3	Iraq	19,5	Portugal	0,0	India	3,5
Estonia	2,3	Bhutan	22,3	Netherlands	0,0	Bolivia	3,5
Hungary	2,3	India	22,6	Malta	0,0	Nepal	3,5
Czech Republic	2,4	Nicaragua	22,7	Maldives	0,0	Guatemala	3,5
United Kingdom	2,4	Ghana	23,1	Serbia	0,0	Tajikistan	4,0
Argentina	2,6	Myanmar	23,2	Belgium	0,0	Gabon	4,2
Poland	2,6	Bangladesh	24,2	United Kingdom	0,1	Cambodia	4,4
Cyprus	2,9	Timor-Leste	25,5	Chile	0,1	Solomon Islands	4,5
Portugal	3,0	Gambia	25,8	Russian Federation	0,1	South Africa	4,8
Uruguay	3,1	Kuwait	25,9	Finland	0,1	Iraq	5,8
Chile	3,2	Nepal	26,0	Denmark	0,1	Lao People's Democra	6,6
Ukraine	3,3	Comoros	26,4	Ukraine	0,1	Ghana	6,8
Slovakia	3,5	Lao People's Democra	26,6	Sweden	0,1	Pakistan	6,9
Belarus	3,8	Malawi	27,0	Mauritius	0,1	Eritrea	7,2
Latvia	3,8	Kenya	27,3	Thailand	0,1	Swaziland	8,2
Jamaica	4,0	Solomon Islands	27,4	Australia	0,1	Yemen	8,6
Malta	4,1	Uganda	27,5	Costa Rica	0,1	Madagascar	9,0
Croatia	4,1	Cameroon	27,8	Norway	0,1	Lesotho	9,2
Kazakhstan	4,2	Swaziland	27,8	TFYR Macedonia	0,1	Togo	9,3
Serbia	4,6	Pakistan	27,8	France	0,1	Djibouti	9,4
Venezuela	4,7	Cambodia	28,6	Republic of Moldova	0,1	Senegal	9,8
Bulgaria	4,7	Rwanda	28,8	United States of America	0,2	Ethiopia	10,0
Mexico	4,8	Yemen	31,1	Ireland	0,2	Comoros	11,1
United Arab Emirates	4,8	Congo	31,3	Bosnia and Herzegovi	0,2	Côte d'Ivoire	11,9
Russian Federation	5,1	Lesotho	31,4	Iceland	0,2	Gambia	12,1
Armenia	5,2	Senegal	31,9	Albania	0,2	Kenya	12,5
Ecuador	5,6	Liberia	32,0	Bahamas	0,2	Mauritania	13,6
Jordan	5,8	Burundi	34,7	Uruguay	0,2	Congo	13,9
Lebanon	5,9	Tanzania	35,1	Oman	0,2	Sudan	15,2
Panama	5,9	Madagascar	35,4	Qatar	0,3	Benin	15,2
Georgia 9	5,9	Togo	35,7	Kuwait	0,3	Timor-Leste	15,3
Bosnia and Herzegovi	5,9	Benin	35,8	Viet Nam	0,3	Mozambique	16,0
Brazil	6,0	Djibouti	37,2	China	0,3	Equatorial Guinea	16,7
Colombia	6,4	Angola	37,2	Lebanon	0,3	Cameroon	16,8
Bahamas	6,5	Equatorial Guinea	40,2	Brazil	0,3	Uganda	18,2
Costa Rica	6,5	Côte d'Ivoire	40,9	Tunisia	0,3	Burkina Faso	19,1
Belize	6,6	Mauritania	41,3	Argentina	0,4	Tanzania	20,1
Albania	6,9	Guinea-Bissau	41,8	Turkey	0,4	Guinea	20,6
Malaysia	7,0	Guinea	42,0	Iran	0,4	Rwanda	20,8
Philippines	7,1	Sudan	42,4	Mexico	0,5	Malawi	22,0
Peru	7,2	Mali	43,6	Armenia	0,5	Angola	22,1
Guyana	7,4	Central African Rep	45,1	Trinidad and Tobago	0,5	Central African Rep	24,6
Kyrgyzstan	7,4	Burkina Faso	47,6	Georgia 9	0,6	Nigeria	26,3
Mauritius	7,5	Nigeria	47,7	Colombia	0,6	Burundi	26,3
TFYR Macedonia	7,5	Eritrea	48,2	Malaysia	0,6	Liberia	26,7
Tunisia	7,9	Mozambique	50,3	Venezuela	0,6	Mali	30,1
Algeria	8,3	Ethiopia	50,6	El Salvador	0,6	Niger	32,8
Uzbekistan	8,5	Chad	55,7	Panama	0,6	Guinea-Bissau	33,4
Turkey	8,6	Niger	60,2	Suriname	0,7	Chad	46,9
El Salvador	8,8			Algeria	0,7		

Republic of Moldova	9,0			Jamaica	0,7		
Thailand	9,1			Peru	0,8		

Source: own calculations using STATISTICA 10.0.

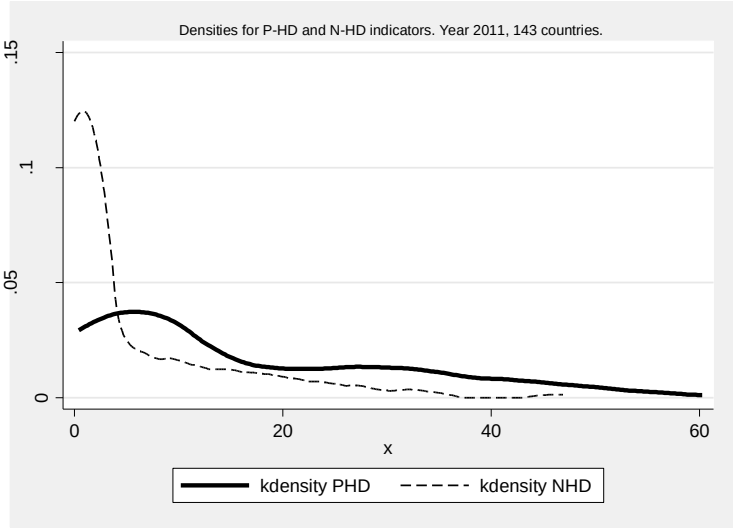
Chart 10. Tree diagram. *N*-HD and *P*-HD variables. Square Euclidean metrics, full linkages. Year 2011, 143 countries (for *N*-HD – Greece excluded; for *P*-HD – Australia excluded).



Source: own elaboration using STATISTICA 10.0.

The tree diagrams (see chart 10 above), shows that in both cases there exists quite numerous groups of countries, which are relatively similar to one another as well as to the reference country. Again, in both cases we identify many countries, which are far behind Australia and Greece. The differences in metrics values – especially for *N*-HD – astonish, however in case of *P*-HD the distance values seem to be more diversified and averagely higher (see chart 11 below). The densities estimates clearly show the differences in the two sets of metrics. The metrics for *P*-HD result to vary significantly across countries, achieving values from 0,4 till 60,2 (the average for all is 15,7, and we investigated 57 countries to be above the average). For *N*-HD they are much less diversified – the emerged one-peak line suggest existence of rather homogenous group of countries that in relation to Greece present only slight differences in achievement in TFR, MMR and IMR. Anyway, the average metric for *N*-HP variables is just 5,3, and 40 economies still remain above the mean.

Chart 11. Distributions of metrics values for *P*-HD and *N*-HD. Year 2011, 143 countries (for *N*-HD – Greece excluded; for *P*-HD – Australia excluded).



Source: own elaboration using STATA 12.00.

3. Concluding remarks.

The main objective of the paper was to investigate the cross-national difference in social development level that existed in the year 2011. We have based the analysis on eight dimensions of social development, collecting statistical data for 144 countries worldwide. Despite presenting quite a reductionist approach, we strongly support the idea that selected variables draw a clear picture of overall social welfare in a country. From the analysis results, we can conclude that in year 2011, the inequalities (according to Gini coefficients) in values of social factors were rather low in most of cases. The lowest Gini coefficient was reported for life expectancy (only 0,07), while for maternal mortality ratio it was 0,64. We see that differences are enormous. However, the Gini coefficients report on relatively low inequalities, if we complete the picture adding by the distributions line for each variable, we see that among countries still exist quite a disparities. In most of cases we deal with the one-peak density line that indicates existence of just one homogenous group of counties (mainly high-income economies), where social variables achieve comparable high levels. The rest of countries (middle and low-income ones), still stays significantly diversified where huge disparities are revealed. Secondly, our analysis has shown relative backwardness of countries in terms of social development. By dividing the variables into two groups, we have identified relative backwardness taking into account factors positively correlated to human development, and separately – the ones correlated negatively. In case of *P*-HD the best performing country was Australia, and for *N*-HD it was Greece. We can conclude that for *P*-HD the relative distances (expressed as metrics values) among countries are more uneven distributed, which

indicates high diversification of countries when *P*-HD factors are taken into account. While, in case of *N*-HD the high diversification disappears, and we observe that for 50 countries the metric value is 0, which is to say that among these economies exist hardly any differences in *N*-HD are taken into account. In general, the low Gini coefficients give an illusion of low disparities among countries in level of social development. However, we do need to have in mind that in the world map, huge disparities exist on the field. Many countries, starting from 60`s have made a great advance in the ladder of social development and improved social factors values significantly. But still we need to note, that a bit less than half of world countries perform poorly on the field and shall improve living conditions in the most of dimensions of social life.

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Appendix 1. Social indicators statistical database. Year 2011[4]. 144 countries.

	Life Expectancy at birth (years)	Drinking water access (%)	Improved Sanitation Coverage (%)	Total Fertility Rate (no of children)	Maternal Mortality Ratio (per 100 000 live births)	Infant Mortality Rate (total, per 1000 live births before age of 1 year)	Combined Gross Enrollment Ratio (% of total no of 3 school groups)	Mean years of schooling (for people at 25 years and older)
Albania	77,315	97	98	1,53	31	17	68	10,4
Algeria	73,445	83	95	2,14	120	21	78	7
Angola	51,685	50	57	5,14	610	96	57,8	4,4
Argentina	76,125	97	90	2,17	70	12	92	9,3
Armenia	74,16	96	90	1,74	29	24	76,3	10,8
Australia	82,07	100	100	1,95	8	4	112,1	12
Austria	80,975	100	100	1,35	5	4	90,9	10,8
Azerbaijan	70,83	80	45	2,15	38	38	70,6	8,6
Bahamas	75,785	96	100	1,88	49	14	74,1	8,5
Bangladesh	69,38	80	53	2,16	340	42	48,7	4,8
Belarus	70,765	100	93	1,48	15	6	90,2	9,3
Belgium	79,985	100	100	1,84	5	4	94,9	10,9
Belize	76,35	99	90	2,68	94	16	75,1	8
Benin	56,75	75	12	5,08	410	77	56,7	3,3
Bhutan	67,865	92	65	2,26	200	38	60,5	2,3
Bolivia	67,09	86	25	3,23	180	41	82,4	9,2
Bosnia and Herzegovina	75,85	99	95	1,13	9	13	75,6	8,7
Botswana	52,51	95	60	2,62	190	35	71,6	8,9
Brazil	74,03	97	80	1,80	58	19	85,1	7,2
Bulgaria	73,7	100	100	1,55	13	9	78,1	10,6
Burkina Faso	55,995	76	11	5,75	560	71	39,1	1,3
Burundi	51,075	72	46	4,05	970	94	59,4	2,7
Cambodia	63,63	61	29	2,42	290	53	58,1	5,8
Cameroon	52,47	74	47	4,29	600	85	60,4	5,9
Canada	81,17	100	100	1,69	12	5	93,4	12,1
Central African Republic	49,515	67	34	4,42	850	96	39,6	3,5
Chad	50,125	50	9	5,74	1200	124	45,6	1,5
Chile	79,29	96	96	1,83	26	7	84,7	9,7
China	73,84	89	55	1,56	38	20	68,7	7,5

[4] Or the last relevant year of data collection.

Colombia	74,035	92	74	2,29	85	17	85,1	7,3
Comoros	61,75	95	36	4,74	340	63	61	2,8
Congo	57,985	71	30	4,44	580	67	50,1	5,9
Costa Rica	79,555	97	95	1,81	44	9	73	8,3
Côte d'Ivoire	56,485	80	23	4,22	470	69	38,1	3,3
Croatia	76,845	99	99	1,50	14	6	80,3	9,8
Cyprus	79,905	100	100	1,46	10	4	85	9,8
Czech Republic	77,87	100	98	1,50	8	3	86,4	12,3
Denmark	79,045	100	100	1,89	5	4	100,3	11,4
Djibouti	58,5	92	56	3,59	300	75	30,4	3,8
Ecuador	75,96	94	92	2,39	140	19	82,1	7,6
El Salvador	72,38	87	87	2,17	110	19	73,4	7,5
Equatorial Guinea	51,615	43	51	4,98	280	93	55,3	5,4
Eritrea	62,075	61	14	4,24	280	48	29,6	3,4
Estonia	74,855	98	95	1,70	12	4	89,3	12
Ethiopia	59,965	38	12	3,85	470	63	55,2	1,5
Finland	80,215	100	100	1,88	8	3	99,7	10,3
France	81,68	100	100	1,99	8	3	94,5	10,6
Gabon	63,29	87	33	3,20	260	44	74,1	7,5
Gambia	59,015	92	67	4,69	400	66	57,3	2,8
Georgia	73,915	98	95	1,53	48	26	72,3	12,1
Germany	80,59	100	100	1,46	7	3	86	12,2
Ghana	64,725	82	13	3,99	350	44	63,3	7,1
Greece	80,1	100	98	1,54	2	4	99,9	10,1
Guatemala	71,53	94	81	3,84	110	26	70,5	4,1
Guinea	54,78	71	19	5,03	680	84	51	1,6
Guinea-Bissau	48,825	61	21	4,88	1000	110	64,6	2,3
Guyana	70,32	94	81	2,19	270	37	78,6	8
Honduras	73,605	86	71	3,00	110	24	71,8	6,5
Hungary	74,65	100	100	1,43	13	5	89,6	11,1
Iceland	82,015	100	100	2,10	5	2	96	10,4
India	66,03	88	31	2,54	230	48	62,6	4,4
Indonesia	70,04	80	52	2,06	240	25	77,6	5,8
Iran	73,39	93	83	1,59	30	23	69,9	7,3
Iraq	70,115	79	73	4,54	75	33	53,5	5,6
Ireland	80,805	100	99	2,10	3	4	101,2	11,6
Israel	81,91	100	100	2,91	7	3	91	11,9
Italy	81,93	100	100	1,48	5	3	91,8	10,1
Jamaica	73,455	94	83	2,26	89	22	86,7	9,6
Japan	83,61	100	100	1,42	6	3	88,1	11,6
Jordan	73,68	96	98	2,89	59	19	78,3	8,6
Kazakhstan	67,565	95	97	2,48	45	24	90	10,4
Kenya	57,93	59	31	4,62	530	58	66,7	7
Kuwait	74,95	99	100	2,25	9	8	30,5	6,1
Kyrgyzstan	68,34	90	93	2,62	81	33	76,4	9,3
Lao People's Democratic Republic	67,92	57	53	2,54	580	37	59	4,6
Latvia	73,65	99	78	1,51	20	7	84,5	11,5
Lebanon	72,905	100	98	1,76	26	20	80,8	7,9
Lesotho	48,895	85	29	3,05	530	62	59,2	5,9
Liberia	57,5	68	17	5,04	990	77	65,3	3,9
Luxembourg	80,14	100	100	1,68	17	2	98	10,1
Madagascar	66,915	41	11	4,49	440	41	69,1	5,2

Malawi	55,02	80	56	5,97	510	86	59,3	4,2
Malaysia	74,685	100	96	2,57	31	7	70,3	9,5
Maldives	77,34	91	98	1,67	37	8	69,3	5,8
Mali	52,035	56	36	6,12	830	92	52,7	2
Malta	79,95	100	100	1,28	8	5	79	9,9
Mauritania	59,165	49	26	4,36	550	70	50,3	3,7
Mauritius	73,645	99	91	1,59	36	12	76,2	7,2
Mexico	77,235	94	85	2,23	85	14	82,6	8,5
Morocco	72,57	81	69	2,18	110	29	61	4,4
Mozambique	50,905	47	17	4,71	550	78	58,8	1,2
Myanmar	66	71	81	1,94	240	45	56,5	4
Namibia	62,555	92	33	3,06	180	30	71,2	7,4
Nepal	69,095	88	31	2,59	380	32	56	3,2
Netherlands	80,82	100	100	1,79	9	4	98,7	11,6
Nicaragua	74,415	85	52	2,50	100	18	45	5,8
Niger	55,28	48	9	6,93	820	86	31,3	1,4
Nigeria	52,535	58	32	5,43	840	88	31,3	5
Norway	81,295	100	100	1,95	7	3	96,9	12,6
Oman	73,905	88	87	2,15	20	8	70,1	5,5
Pakistan	65,865	90	45	3,20	260	66	42	4,9
Panama	76,47	93	69	2,41	71	16	78,9	9,4
Paraguay	72,845	86	70	2,86	95	27	70,4	7,7
Peru	74,32	82	68	2,41	98	18	81,4	8,7
Philippines	69,285	91	76	3,05	94	21	80	8,9
Poland	76,355	100	90	1,42	6	6	88,9	10
Portugal	79,785	99	100	1,31	7	4	94,1	7,7
Qatar	78,46	100	100	2,20	8	8	57,4	7,3
Republic of Korea	80,605	98	100	1,39	18	4	100,3	11,6
Republic of Moldova	69,815	90	79	1,45	32	14	69,5	9,7
Russian Federation	69,165	96	87	1,53	39	11	84,3	9,8
Rwanda	55,8	65	54	5,28	540	93	67,6	3,3
Senegal	59,775	69	51	4,61	410	50	45,7	4,5
Serbia	74,75	99	92	1,56	8	11	79	10,2
Slovakia	75,71	100	100	1,37	6	6	81,7	11,6
Slovenia	79,465	99	100	1,48	18	3	94,5	11,6
Solomon Islands	68,49	70	32	4,04	100	35	54	4,5
South Africa	53,61	91	77	2,38	410	46	70	8,5
Spain	81,79	100	100	1,50	6	4	100,7	10,4
Sudan	62,01	57	34	4,23	750	57	38	3,1
Suriname	70,995	93	84	2,27	100	20	69,3	7,2
Swaziland	49,115	69	55	3,17	420	65	63,7	7,1
Sweden	81,65	100	100	1,93	5	3	92,1	11,7
Switzerland	82,44	100	100	1,54	10	4	86,2	11
Syrian Arab Republic	76,085	89	96	2,77	46	14	66,4	5,7
Tajikistan	67,99	70	94	3,16	64	51	71,6	9,8
Macedonia	75,09	100	89	1,40	9	13	71,6	8,2
Thailand	74,43	98	96	1,53	48	11	71,4	6,6
Timor-Leste	63,16	69	50	5,92	370	56	67,8	2,8
Togo	57,82	60	12	3,86	350	67	56,7	5,3
Trinidad and Tobago	70,35	94	92	1,63	55	24	62	9,2
Tunisia	74,835	94	85	1,91	60	18	77,8	6,5

Turkey	74,325	99	90	2,02	23	20	74,1	6,5
Uganda	54,635	67	48	5,90	430	72	66,8	4,7
Ukraine	69,05	98	95	1,48	26	12	91,6	11,3
United Arab Emirates	77,01	100	97	1,71	10	7	78,1	9,3
United Kingdom	80,335	100	100	1,87	12	5	90	9,3
Tanzania	59,27	54	24	5,50	790	54	56,6	5,1
United States of America	78,74	99	100	2,08	24	6	93,5	12,4
Uruguay	77,17	100	100	2,04	27	12	90,4	8,5
Uzbekistan	68,8	87	100	2,26	30	44	70,8	10
Venezuela	74,755	93	91	2,39	68	15	88,7	7,6
Viet Nam	75,43	94	75	1,75	56	18	70	5,5
Yemen	66,08	62	52	4,94	210	44	54,4	2,5

Source: own compilation based on data from United Nations Millennium Development Goals Database, United Nations Department of Economic and Social Affairs, Population Division, UNESCO, World Health Organization, International Human Development Indicators databases. Accessed: Sept 2012.

Appendix 2. Variables definitions.

Variable	Definition	Source of data
Life Expectancy	Life expectancy at birth is an estimate of the number of years to be lived by a female or male newborn, based on current age-specific mortality rates. Life expectancy at birth by sex gives a statistical summary of current differences in male and female mortality across all ages. In areas with high infant and child mortality rates, the indicator is strongly influenced by trends and differentials in infant and child mortality (UN).	United Nations, Department of Economic and Social Affairs, Population Division (2011), World Population Prospects: The 2010 Revision.
Drinking Water Access	Coverage estimates are expressed as the percentage of the population using improved drinking water sources (UN).	United Nations, MDG Database
Improved Sanitation Coverage	Coverage estimates are expressed as the percentage of the population using improved sanitation facilities (UN).	United Nations, MDG Database
Total Fertility Rate	The adolescent fertility rate is defined as the annual number of live births born to women aged 15 to 19 years per 1,000 women in the same age group. The indicator is used to monitor adolescent reproductive behavior and to assess the relative contribution of adolescent fertility to the total fertility rate (UN)	United Nations, Department of Economic and Social Affairs, Population Division (2011), World Population Prospects: The 2010 Revision.
Maternal Mortality Rate	The maternal mortality ratio is the annual number of female deaths from any cause related to or aggravated by pregnancy or its management (excluding accidental or incidental causes) during pregnancy and childbirth or within 42 days of termination of pregnancy, irrespective of the duration and site of the pregnancy, per 100,000 live births, for a specified year (UN).	United Nations, Department of Economic and Social Affairs, Population Division (2011), World Population Prospects: The 2010 Revision.
Infant Mortality Rate	Infant mortality rate is the total number of infants dying before reaching the age of one year per 1,000 live births in a given year. It is an approximation of the number of deaths per 1,000 children born alive who die within one year of birth (UN).	United Nations, Department of Economic and Social Affairs, Population Division (2011), World Population Prospects: The 2010 Revision.
Combined Gross Enrollment	Designates a nation's total enrollment "in a specific level of education, regardless of age, expressed as a percentage of the population in the official age group corresponding to this level of education. (UNESCO). Combined enrollment refers to 3 levels of education.	UNESCO
Mean Years of Schooling	Average number of years of education received by people ages 25 and older, converted from education attainment levels using official durations of each level (UNDP)	International Human Development Indicators

Source: own compilation based on information from United Nations Millennium Development Goals Database, United Nations Department of Economic and Social Affairs, Population Division, UNESCO, World Health Organization, International Human Development Indicators databases. Accessed: Sept 2012.